Subject: glowbugs V1 #238
glowbugs Thursday, February 5 1998 Volume 01 : Number 238

Date: Wed, 4 Feb 1998 15:17:21 -0500 (EST)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: Ancient 60cycle AC ammeters at RF --- yes/no? (maybe)

> Bob Keys, NA4G, wrote:
> > In my junk box of RF ammeters, I have a
> > couple dating from the 20's or maybe late teens that are marked as
> > being usable for ac up to
> > 2,000,000 cycles (call that 160M). This raises several questions.
>
> These are not likely to work very well at higher frequencies. I will
> explain this below.

Higher for me on glowbugging in the rigs in particular is going to be
80M. I would expect I might be able to push that far without serious
difficulty due to meter construction (at least I am hoping I can).
It could be the meters are early enough that that was given as making
the meters suitable for hamradio use on the ``short waves'' of 200
meters and down. If that is the case, I would expect them to work
up on 80, also.

> > 1. I was reading in Ghirardi's Radio Physics Course (1933 ed), that
> > AC ammeters could be used on DC to short waves with impunity.
> > What effect would occur if 60 cycle meters were used on 160 or
> > 80M? My gut feeling tells me that they should work fine, but
> > perhaps the higher in frequency you go, the heating effect may be
> > a little greater and the calibration may be off some, maybe giving
> > rise to the 2,000,000 cycle rating on the meters.
>
> Remember these are thermocouple-type meters and NOT the normal moving
> vane AC ammeters which do not work at RF.

OK, I was aware of that. Thermocouples should work, in theory at any
frequency, I was thinking, that would be practical for glowbugs (160-
40M or so). I know the meter is listed for 160M, and my thinking was
that barring some unforseen gotcha it may have a usable limit higher
up for just general output indication (not accurate reading).

> Thermocouple meters have a small current shunt inside through which the
> current to be measured is passed. This is often a tiny platinum wire.
> This wire is often coiled to get a higher resistance in a small space
> around the thermocouple. At higher frequencies, this inductance can
> alter the sensitivity. Capacitance to ground from the shunting resistor
> also creates problems.

The shunt, I would expect would not have that much inductance until up around
10mhz or so (I could be wrong, but thought that if it was rated up to 2mhz
then it should read up to considerably higher than that). The inductance
could be a problem and would need to be looked at inside the meter.

> > 2. Also reading in Ghirardi suggested that most RF ammeters were
> > RMS calibrated devices. Other than comparing against known
> > meters, how would one check this out? Some are apparently
> > marked, but are there other indicators or constructional
> > details that one should look at?
>
> Use the 50 ohm dummy load and the voltmeter circuit I described
> yesterday to check the calibration.

OK, that is reasonable.

> > 3. Thermocouple ammeters seem to be nothing but low-range
> > galvanometers
> > or dc microammeters with a series resistance and the thermocouple

> >   junction. If one wanted to recalibrate these early meters for
> >   use on HF and rescale them perhaps, is there anything other than
> >   shunting the internal series resistance that one should be aware
> >   of?
> >
> See the description above for what is really in the meter. The
> thermocouple output is proportional to its temperature (but since you
> have no reference junction room temperature affects the calibration).
> Putting more current through the shunt, and increasing the series
> resistance from the thermocouple is asking for the shunt to be
> destroyed. Any time you change the resistances, the sensitivity is
> changes - but you also change the shape of the scale too!

The meter movement itself is a low range dc meter. The thermocouple
generates the dc from heating in the platinum element. As such, I
would expect anything that was done to alter the sensitivity by LESSENING
the series meter resistance between the thermocouple and the meter would
INCREASE the sensitivity of the unit (within limits of the meter sensitivity).
One could go so far as to totatlly remove the series resistor and let the
thermocouple operate the meter directly, and not disobey any particlular
electronic rules. The point about the possible inductive or capacitive
properties of the main line shunt are well taken, and I had not thought
about that (all the pictures show a straight shunt between the terminals
diagrammatically, and I have yet to open one up and peer inside). Operated
on less current, there should be no effect on the thermocouple.

Overpowering the thermocouple would be disaster. But, most are rated at
at least 150% overcurrent without blowing. BUT, what I was wanting to do
was go the OTHER way to increase the sensitivity of the meter from say
10 amps down to 3 or 2 or 1 amps or such. Adjusting the series resistance
is how the meters are calibrated in the first place, so adjusting them down
should not, of itself present any problems. Finding the right resistance
value to set the desired full scale could be problematic in getting the
right sized resistors and values. Since they are all current squared
meters, I would not expect the shape of the calibration scale to be much
off from normal, although I have seen some deviate on the high end some.
This also assumes that the meter movement is sensitive enough to work on
less current --- that I don't know, yet.

The thermocouples themselves could also be a problem. External thermocouples
have a cast body that might include the series resistor already, so that
would preclude adjusting those things, unless the block could be opened up.
I was hoping inside the meters, the thermocouples would not be blocked up
in a casting with the series resistor, and thus be adjustable, by adjusting
the series resitor.

As to calibration, I was looking to recalibrate it to my needs for the
glowbug in question. That would entail a controlled set of powers to
redo the scale in the range desired. That would be easy. These meters
will probably never be used again, otherwise. The ranges are just too
high for most ham stations on 50 ohm loads (as opposed to the 1-10 ohm
loads they were originally used on). Most everything I run tends to
be more to 50 ohms and higher, so overrunning the meter should not be
a problem. The largest current I am expecting is around 3 amps from
the big rigs and 1 amp from the glowbugs. The peak meter method you
gave yesterday should be fine. It will be my weekend project.

> > The reasoning behind this is that those old meters sure do look nice,
> > and would make a great output indicator on an early period glowbug
> > panel set with something like a 211 or a 204A puffing away.
> >
> > Bob/NA4G
>
> Bleech - how I hate Micros**t Access!.. Trying to quote text properly
> is next to impossible. The UNIX folks have it right!
> Sorry if the quoting in this message is garbled.

It came through OK.

Oh, well, we will pardon you this time.....(:+}}..... FREEBSD FOREVER!

> Bob, I would test the meters using the 6AL5 and a VTVM with your dummy
> load. I would not try to modify them, but you might consider drawing a
> new scale.

The basic modification that I had anticipated was merely to bypass with
a suitable shunt resistance the series meter movement calibration resistor.
That would allow me to set the desired full scale. Then remark the dial
scale and it should be fine. Basically I am looking to redo the 10 and
20 amp meters down to 1 to 3 amps. My intuition tells me it should be
reasonable with some care inside the meter cases. How far one could go
practically, and how high up in frequency remains to be seen, but I am
willing to experiment some with them to see. That is what glowbugging
is all about.....

>   73, Barry WA4VZQ ornitz@eastman.com

Thanks for your input, Barry, I always have deep respect for it.

73/ZUT DE NA4G/Bob UP

Date: Wed, 4 Feb 1998 14:16:47 -0600 (CST)
From: mjsilva@ix.netcom.com
Subject: Re: regenerative set

On 02/04/98 11:07:05 you wrote:
>
>A quick glowbug question. Is there a best choice for a tube
>and socket for a homebrew regenerative set these days? A source
>for the tube, socket and specs are important. The kits available
>are transistorized, and I think that won't present the correct look
>and feel to my 11 year old.

I'd recommend a miniature triode-pentode (there are probably dozens of types, e.g. 6U8, 6EA8, etc). There's a design in the late '50s handbooks that uses a 6U8 (but any other type should work if the socket is correctly wired). Another good alternative is a twin triode such as the octal 6SN7, 6SL7, 6C8G or the miniature 12AU7, 12AT7. There are designs for twin triode regens in most (all?) Handbooks from the early '40s to the mid '50s. All of these tubes are easily available, although some of the twin triodes are more expensive since the golden ears are chasing after them as well. The sockets, 8 pin octal or 9 pin miniature, should also be easy to get. Antique Electronic Supply in AZ is probably the biggest source for these kinds of parts, but there are plenty of others. Take a look at Brian Carling's parts lists web page for a good selection of suppliers (you'll have to search for it since I don't have a URL).

Let me know if you have further questions or need a schematic. One way or another we'll get you and your 11 year old up and running...

73,
Mike, KK6GM

Date: Wed, 4 Feb 1998 14:32:11 -0600
From: mack@mails.imed.com (Ray Mack)
Subject: Canada Money help

My disk crashed and I lost all of my addresses I had saved or I would have
addressed this directly to Shaun Merrigan in Canada.

A gent here at work had a friend in Canada buy a rig for him and now he
needs to send him some money. Martin is just over here from Germany and is
not familiar with how easy it is to get things done here in North America.
If I remember correctly I just sent Shaun a check drawn on a US bank in US
dollars and he just cashed it at his bank.

Can anyone in Canada confirm if my memory is correct on this?

Ray Mack
WD5IFS
mack@mails.imed.com
Friendswood (Houston), TX

Date: Wed, 04 Feb 1998 12:58:52 -1000
From: Peter Demmer <ampruss@hits.net>
Subject: Re: 3579 QRG, last night.

Ken Gordon wrote:
>
> > Greetings again Ken; What time are you guys glowing from across the
> > pond? Aloha, Peter, KH6CTQ.
>
> Lessee...I think we first worked about 0130, then about 0230 I heard the
> others. I often listen off and on until about 0500
>
> Ken
Tnx Ken and I assume that time slot is in GMT/UTC. If it is, it looks pretty good for my present evening gray line opening slot. I will listen. Im using a full length, (282 ft), home brewed CCD'A (Capacitively Coupled Dipole Antenna, deployed in a triangular loop with the apex (center) of one 1/2 wave length leg up at 55 ft. The other 1/2 wave leg is 18 ft. above the ground and bent at a 90 degree under the upper half wave. I feed it in the middle of the full wave length at one corner (18 ft. above ground) The opposite corner (ends) comes almost together. These ends are insulated from each other. So it's an open ended triangular full wave loop. The Feeder is twin paralled RG-62A/U. This has an impedance of 90 ohms each or 180 ohms parallel balanced feeder to a 4:1 true current balun and a simple switchable LC/CL congigate antenna transmission line matching system. Yes works very efficiently on all bands. My Plate & Screen power supplies are taking shape and presently hanging in the varic. Aloha, Peter, KH6CTQ

Date: Wed, 4 Feb 1998 18:30:36 -0500
From: "Ornitz, Barry L" <u856010@eastman.com>
Subject: Thermocouples

Yep, maybe.

> The meter movement itself is a low range dc meter. The thermocouple
> generates the dc from heating in the platinum element. As such, I
> would expect anything that was done to alter the sensitivity by
> LESSENING
> the series meter resistance between the thermocouple and the meter
> would
> INCREASE the sensitivity of the unit (within limits of the meter
> sensitivity).
>
In principle, this is true. You could also add a low resistance across the shunt (heater) to decrease the sensitivity.

> One could go so far as to totatlly remove the series resistor and let
> the
> thermocouple operate the meter directly, and not disobey any
> particlular
> electronic rules. The point about the possible inductive or
> capacitive
> properties of the main line shunt are well taken, and I had not
> thought
> about that (all the pictures show a straight shunt between the
> terminals
> diagrammatically, and I have yet to open one up and peer inside).

> Operated
> on less current, there should be no effect on the thermocouple.
>
This gets into thermocouple theory and I was hoping to avoid
this...but...

A thermocouple is an interesting device that is often misunderstood. Most people think it measures temperature. It does not. A better description is that it measures temperature differences (this is really incorrect too but this model handles most normal questions about thermocouples). Any two dissimilar metals in contact with each other form a thermocouple. Twist a copper and an iron wire together and you have a thermocouple. Naturally certain metal (or alloy) pairs are optimized for reproducibility and maximum output.

Thermocouples are always used in a loop connection. The ideal case would be two dissimilar wires twisted together at both ends. Then you cut one of the wires to insert your voltage measuring device. If the measuring device is made of a third metal, you suddenly have created two more thermocouple junctions.

For example, let us use Iron and Constantan as the two thermocouple wires (this is a standard Type J thermocouple), and we cut the Constantan wire in the middle to insert our voltmeter which has copper leads. We have four wire junctions:

```
Fe---------------------------------Fe
CN------CNCu-----(VM)-----CuCN------CN
```

We stick the left junction into ice and heat the right junction with boiling water. We will leave the voltmeter at room temperature of 25 C. We can look up from standard tables what the voltage should be. These tables reference ice at 0 C.

Iron is positive with respect to Constantan so the right junction produces 5.269 millivolts. The left (ice) junction produces zero volts. But at the left meter connection we get -0.992 mV. At the right meter connection we get +0.992 mV so these fortunately cancel. If the left and right meter connections were not at the same temperature, however, the voltages ould not cancel and there would be some error. This is why you often see "isothermal" terminal strips in thermocouple connections.

But what happens if the voltmeter is not an infinite impedance and it draws current? In this case the right junction would cool and the left would heat transferring energy from the hot to the cold side. [Forcing current in the opposite direction can cool one side and heat the other, a Peltier cooler.]

In a thermocouple RF ammeter, there is no reference junction and the millivoltmeter draws considerable current. This immediately leads to the problem of room temperature affecting the reading. Furthermore the voltage developed (even with a proper reference junction) is a nonlinear function of temperature. In the RF ammeter, a rise in room temperature will cause a drop in the meter reading.

Now add the fact that the shunt heater's resistance changes with its temperature, and that its heat lost is a strong function of temperature. All these effects combine to create the highly nonlinear scale of an RF ammeter. The current-square relationship is only a crude approximation.

Lowering the series resistance in the millivoltmeter circuit will cause more current to flow but it will also cool the hot junction more. The result is that the scale on the meter is quite specific to a certain design. Alter things internally and
even if the full-scale is correct, the readings will not track properly.

> Overpowering the thermocouple would be disaster. But, most are rated
> at
> at least 150% overcurrent without blowing. BUT, what I was wanting to
> do

> was go the OTHER way to increase the sensitivity of the meter from say
> 10 amps down to 3 or 2 or 1 amps or such. Adjusting the series
> resistance
> is how the meters are calibrated in the first place, so adjusting them
> down
> should not, of itself present any problems. Finding the right
> resistance
> value to set the desired full scale could be problematic in getting
> the
> right sized resistors and values. Since they are all current squared
> meters, I would not expect the shape of the calibration scale to be
> much
> off from normal, although I have seen some deviate on the high end
> some.
> This also assumes that the meter movement is sensitive enough to work
> on
> less current --- that I don't know, yet.
>
See the comments above about tracking and full scale.
..
> The basic modification that I had anticipated was merely to bypass
> with
> a suitable shunt resistance the series meter movement calibration
> resistor.
> That would allow me to set the desired full scale. Then remark the
> dial
> scale and it should be fine. Basically I am looking to redo the 10
> and
> 20 amp meters down to 1 to 3 amps. My intuition tells me it should be
> reasonable with some care inside the meter cases. How far one could
> go
> practically, and how high up in frequency remains to be seen, but I am
> willing to experiment some with them to see. That is what glowbugging
> is all about.....
>
I tend to doubt you can push the sensitivity this far without a serious
alteration in the scale tracking. Please let me know how it works out.

                73, Barry WA4VZQ ornitz@eastman.com

Date: Wed, 4 Feb 1998 19:10:12 -0500
From: JMcAulay <jmc@qnet.com>
Subject: Re: Ancient 60cycle AC ammeters at RF --- yes/no?

At 10:57 AM 2/4/98 -0500, you wrote:
>In my junk box of RF ammeters, I have a couple dating from the 20's or maybe
>late teens that are marked as being usable for ac up to 2,000,000 cycles
>(call that 160M). This raises several questions.
>
>1. I was reading in Ghirardi's Radio Physics Course (1933 ed), that
>   AC ammeters could be used on DC to short waves with impunity.
>   What effect would occur if 60 cycle meters were used on 160 or
>   80M? My gut feeling tells me that they should work fine, but
>   perhaps the higher in frequency you go, the heating effect may be
>   a little greater and the calibration may be off some, maybe giving
>   rise to the 2,000,000 cycle rating on the meters.
>
>2. Also reading in Ghirardi suggested that most RF ammeters were
>   RMS calibrated devices. Other than comparing against known meters,
>   how would one check this out? Some are apparently marked, but are
>   there other indicators or constructional details that one should
>   look at?
>
>3. Thermocouple ammeters seem to be nothing but low-range galvanometers
>   or dc microammeters with a series resistance and the thermocouple
>   junction. If one wanted to recalibrate these early meters for
>   use on HF and rescale them perhaps, is there anything other than

>   shunting the internal series resistance that one should be aware of?
>
>The reasoning behind this is that those old meters sure do look nice,
>and would make a great output indicator on an early period glowbug
>panel set with something like a 211 or a 204A puffing away.
>
>Bob/NA4G
>

Hi, Bob:

Here's my two kopecks worth from Broadcast experience:

1. "AC" ammeters are generally not of the thermocouple type.   AC ammeters generally become quite inaccurate at higher frequencies.   Not certain it's a good idea to trust one even at a frequency as high as 2,000 kHz, but if it says you can, then... well... why not.

2.   Every RF ammeters I've ever seen was definitely an RMS device.   Best way to calibrate one, in fact, is by shoving 60 Hz (or whatever you have handy) alternating current through the thing, in series with a precision AC ammeter.

3.   Thermocouple ammeters are generally rated to 60 MHz or so, usually stated on the front panel.   You're correct: it's really a microammeter which has a thermocouple attached thermally to a VERY low-value resistor (like maybe 0.05 ohm or less).   Some have the thermocouple external to the meter case.   These will most likely have three terminals on the back of the case.   Should you run across one of these without the thermocouple, it's pretty worthless except for experimental attempts to get something to work with it.   Otherwise, anyone who wants to fool around inside a thermocouple ammeter -- doing things like changing the thermocouple resistor -- has far more bravery than I.   Suggest it would be far better to trade the meter that's out of your range for one that you need.

BTW, Delta Electronics now makes RF ammeters which are nice remote-reading things.   Their product uses a toroid current transformer around the RF-carrying line to provide a bit of RF drive for a detector circuit so that DC is fed to a milliammeter.   Very accurate and stable stuff.   [You might imagine, thermocouple ammeters have lots of failure mechanisms.]

Regards,
John

Date: Thu, 05 Feb 1998 00:39:16 GMT
From: wrt@eskimo.com (Bill Turner)
Subject: Re: Ancient 60cycle AC ammeters at RF --- yes/no?

On Wed, 4 Feb 1998 10:57:49 -0500 (EST),
rdkeys@csemail.cropsci.ncsu.edu wrote:
<snip>

>In my junk box of RF ammeters, I have a couple dating from the 20's or =
maybe
>late teens that are marked as being usable for ac up to 2,000,000 cycles
>(call that 160M). This raises several questions.
>
>1. I was reading in Ghirardi's Radio Physics Course (1933 ed), that
>   AC ammeters could be used on DC to short waves with impunity.
>   What effect would occur if 60 cycle meters were used on 160 or
>   80M? My gut feeling tells me that they should work fine, but
>   perhaps the higher in frequency you go, the heating effect may be
>   a little greater and the calibration may be off some, maybe giving
>   rise to the 2,000,000 cycle rating on the meters.
_____
The skin effect in the heating element could be a problem at high
current levels. Hot spots could develop as a result of current being

concentrated on the outer surface. =20

Another problem could be the introduction of reactance into the coax
on the higher bands. If the meter is physically small, this might not
be a problem until you get to 15 or 10 meters. =20

73, Bill W7TI

Date: Wed, 4 Feb 1998 17:21:34 -0800 (PST)
From: Ken Gordon <keng@uidaho.edu>
Subject: Re: regenerative set

> A quick glowbug question. Is there a best choice for a tube
> and socket for a homebrew regenerative set these days? A source
> for the tube, socket and specs are important. The kits available
> are transistorized, and I think that won't present the correct look
> and feel to my 11 year old.

You might take a look at my web page at

http://www.mines.uidaho.edu/~keng/

and take the link to the schematics page.

There are three regen receivers there. The first one which uses a
twin-triode battery type tube, a 1G6, would be quite suitable for use with
any decent twin-triode tube such as the 12AT7, 6SN7, etc, although I would
use the one with the highest transconductance.

One problem with heater/cathode type tubes is a greater possibility of
hum, but this can be reduced or eliminated by proper construction.

Ken W7EKB

Date: Wed, 4 Feb 1998 17:24:04 -0800 (PST)
From: Ken Gordon <keng@uidaho.edu>
Subject: Re: 3579 QRG, last night.

> congigate antenna transmission line matching system. Yes works very
> efficiently on all bands. My Plate & Screen power supplies are taking
> shape and presently hanging in the varic. Aloha, Peter, KH6CTQ

Your antenna sounds like it is REALLY neat! Sure wish I had room for such.

I was listening last night up until 0700 GMT/UTC, but don't ordinarily do
that.

Also, most of us listen and operate a bit lower than the TV QRM.

See you there.

Ken

Date: Wed, 4 Feb 1998 20:20:25 -0600
From: w5hvv@aeneas.net (Roderick M. Fitz-Randolph)
Subject: Chirpy Viking Ranger

I am in the process of attempting to repair a Viking Ranger for a
friend of mine that has entrusted it to me for that purpose (talk
about mis-guided trust!). I have used kerosene to clean up the
chassis and so forth and it looks like a million dollars now.....

but the purpose he gave it to me was to get it to quite chirping and migrating up the frequency while transmitting. I have removed the side panel from the VFO unit and the OA2 is glowing all the time; just a tad less when the key is down, so I discount it as a problem. I don't have (at the moment) a spare 6AU6 to try but can get one from my supply tomorrow or the next day.

My question is: is there anyone out there that has encountered a similar problem and is there something easy to do that will correct it? I have an absolute horror of trying to remove the entire VFO so that I may get to any temperature sensitive capacitors or the tuning capacitor. It appears that I would have to take off the front panel. I am not into that much pain. Is there anything else that is a viable alternative? Anyone had to fix a similar problem on their Viking Ranger and can tell me where to go to look for the problem?

Thanks,

Rod, N5HV
w5hvv@aeneas.net

Date: Wed, 4 Feb 1998 17:44:34 -1000
From: Jeffrey Herman <jeffreyh@hawaii.edu>
Subject: Vacuum Tube Enthusiasts Weekend (fwd)

A vacuum tube enthusiasts weekend is slated for February 7th and 8th in San Francisco, California. Sponsored by Vacuum Tube Valley Magazine, the Northern California Tube Audio and Enthusiasts Group and the California Historical Radio Society, this two day event offers something for every electron tube enthusiast. For more information contact Vacuum Tube Valley Magazine at: (408) 733 6146
or check their website at: www.vacuumtube.com

Jeff KH2PZ

Date: Wed, 4 Feb 1998 23:44:42 -0600 (CST)
From: mjsilva@ix.netcom.com
Subject: How to make a dial?

Hi all,

I've put a few projects on hold due to lack of a suitable (read ANY) dial. That got me to wondering if it's feasible to try to build them. I was thinking along the lines of a circular piece of plastic (any recommendations on the type?) with a nice set of laser-printed scales on yellowed parchment paper (should look great with a backlight!). The two methods I can think of to drive the dial are a friction drive along the edge of the dial (I've seen regular grommets used to drive such dials) or a dial string around the dial (this would need a thicker piece of plastic with a dial string groove cut in, and a method <small screws? angled notches?> to attach the dial string).

So, any comments on any of this? I'm especially concerned about how to come up with a round piece of plastic, and the mechanical mounting of the dial and tuning knob. Then there's the bezel... OTOH, being able to come up with a classic two-dial panel is a goal worth some experimenting.

Hope to hear from some of you clever folks on this!

73,
Mike, KK6GM

Date: Thu, 05 Feb 1998 09:53:52 -0400
From: Bill Meara <wmeara@erols.com>
Subject: Re: How to make a dial?

At 11:44 PM 2/4/98 -0600, you wrote:
>Hi all,
>
>I've put a few projects on hold due to lack of a suitable (read ANY) dial.

Mike: I faced the same problem on a HB superhet RX. Here's what I did: I used a simple 365 pf variable for the main tuning cap. Plucked out some of the blades to bringit down to the needed value. Connected it to a Jackson 6:1 reduction drive (they are available). Then I used the top part of a coffee can (the part you throw away when you open the can) as the dial. Attach the dial to the outer portion of the reduction drive (there are two very convenient screws). Any tuning knob will do for the main control. Mark the coffee can top as appropriate.

I think a discarded compact disc would also be useful as a dial (in lieu of the coffee can thing!)

Good luck!

73 de N2CQR
Bill Meara, Falls Church, Virginia
wmeara@erols.com G-QRP #7965
http://www.mindspring.com/~johnmb/billm.htm

Date: Thu, 05 Feb 1998 12:40:24 +0100
From: Jan Axing <janax@algonet.se>
Subject: Re: How to make a dial?

Bill Meara wrote:

> I think a discarded compact disc would also be useful as a dial (in lieu of
> the coffee can thing!)

I hereby nominate Bill for the GIOTH. (Glowbug Idea Of The Month.)
Excellent!

Jan, SM5GNN

Date: Thu, 5 Feb 1998 08:14:51 -0600 (CST)
From: Gary Pewitt <gpewitt@execpc.com>
Subject: Re: How to make a dial?

I have (at work) a program called "Neato" that prints labels for cd's. It will include graphics and will wrap the lettering around the cd. It also comes with an applicator to perfectly center the label on the cd. The labels come 6 to a sheet and peel off to stick on the cd. Cost about 59 bucks from Tiger Software catalog. Would make very fine faces for the cd dials. You can fiddle with the layout and print on plain paper until you get it perfect before you print the label. I have made some fine looking labels and am going to try some dial faces soon. Works great with laser printers and color ink jets. Probably gives good results with a good quality dot matrix printer too.
Hope this was of some interest. 73 Gary

On Thu, 5 Feb 1998, Jan Axing wrote:

> Bill Meara wrote:
>
> > I think a discarded compact disc would also be useful as a dial (in lieu of

> > the coffee can thing!)
>
> I hereby nominate Bill for the GIOTH. (Glowbug Idea Of The Month.)
> Excellent!
>
> Jan, SM5GNN
>

gpewitt@execpc.com N9ZSV   414 355 8147
Gary Pewitt 6120 W. Calumet Rd. Apt 204
Milwaukee, WI 53223.   Boatanchor buff

Date: Thu, 5 Feb 1998 10:52:28 -0500 (EST)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Glowbugge RF ammeter play.... mixed results

Last night I emptied out my box of RF ammeters and AC meters, and did some play twiddling. I was hoping I could get inside the meters and adjust the meter sensitivity by playing with the meter series current limiting resistor. Well, that generally did not work, at least in my hands (big lugs best suited to wrestling matches rather than delicate meter work). I did find out some interesting things though.

1. Old AC meters of the Weston 271 type (nice 8 inch half moon shaped meters) turned out to be of two types --- 1) moving iron type and rectifier type. The moving iron meters were unusable at RF because of the iron mass in the meter movement. They were OK on DC or 60 cycle. The rectifier meters turned out to work very well on HF, even though rated at 60 cycle. The 250 volt AC meter turned out to be 872 ohms per volt AC and about 1.2 ma full scale. Thus, a simple wire shunt across the meter terminals (about 6 inches across) held up next to the antenna line gave full scale deflection on 80M with about 20 watts going out the antenna line. This one will make a perfect antenna output meter for the ancient glowbugge-to-be, pending recalibration of the scale card to mimic RF amperes equivalents. I had one other early AC meter dating from 1900, and it was a GE Thompson slant-coil voltmeter. It worked fine on DC or 60 cycle, but did not do anything higher up (meter iron and coil mass again). I will probably use that for the line AC input meter on the glowbugge. Nothing like a big panel with all those ancient meter thingies to give some character to a Glowbugge set......(:+}}.....

2. The RF ammeters turned out to be of two types --- internal thermocouple and external thermocouple (with no way to easily tell between the two types even opened up). I did find an external 3/4 amp RF thermocouple that may have come from the ARC-5 antenna meter box, but I am not sure. It worked fine on the external thermocouple meters. I opened up all the meters to see if there was any way to adjust the meter series current limiting resistor ---- there ain't in my hands. The resistor usually was a small coil of resistance wire (DSC about 30-36 guage or so) and it would have been too hard to work with, except under a low power microscope). The thermocouple turned out to be, in every case except one (which was a glass thimble sealed model), a 1/8 inch length of platinum wire of about no. 30-40 guage and and the thermocouple was smack in the middle of that tiny stretch, and was about the size of a human hair. Egads, no way my big mitts would be able to work with those except under a micromanipulator. I had one big meter rated at 10 amps and the rest turned out to be 1/2/3/5 amp sizes, with a couple at low ma ranges (I use those for neutralization of rigs). Interestingly, the 10 amp RF ammeter (WWII GE thing) had written on the face ``25 cy to 20 mc - calibrated at 60 cy''. This would suggest that the thermocouples of the RF ammeters would all be good on 80M, regardless of rating. I opened up the antique meters that were rated at 25-2,000,000 cycles and they were the same sort of 1/8 inch platinum shunt construction as the WWII meters. I tried the 2,000,000 cycle rated meter on 4,000,000 cycles (80M) and it worked just fine. I would

expect all the radiofrequency ammeters would be of the same basic short shunt construction. I dunno about low freqency AC ammeters, though.

Although my big mitts would preclude doing microsurgery on the things, these old RF ammeters and AC meters are most interesting playthings. One of these days a real old half moon RF ammeter in the 1 to 3 amp range will surface, but until then, the AC voltmeter with a recalibrated scale will do with a short pickup line. My guess is that it is really a 0-1 ma meter with a factory full wave bridge copper oxide rectifier inside. As long as I can get an indication proportional to the output power, it really does not matter much how it gets there, if the scale can be calibrated appropriately.

Question.... on the old Weston 271 AC meters, are they calibrated as RMS or average reading meters? For fun it might also be interesting to convert the thing to be a peak reading RF voltmeter (to keep in proper form with the FCC PEP measurements.....(:+}}.....antique style).

Happy Glowbugging!

Bob/NA4G

Date: Thu, 5 Feb 1998 09:02:44 -0600
From: "Freeberg, Scott (STP)" <scott.freeberg@guidant.com>
Subject: RE: Chirpy Viking Ranger

Rod,

I just finshed troubleshooting my Valiant (with the same VFO as the Ranger) for a problem that may apply to you.

In my case, the transmitter started blowing 1.5 amp low voltage fuses. There is an 18 K current limit resistor inside the vfo case between the OA2 and the +300 volt power supply. I have been told by several folks on this list that the resistor power rating is underspecified and it has a tendency to run way hot and eventually burn up. In my case, it burnt up and ruptured, changing the resistance value from 18K to 150 ohms. This caused the OA2 to burn up trying to regulate the voltage under high current conditions. When the OA2 burned up, the 6AU6 was damaged by having 300 volts applied to the screen. Then of course the 5V4 300 volt rectifier tube burned out.

It working very well now and glad to have it back. I replaced the 18K with two 36K 6 watt parts in parallel and mounted them to a new terminal strip under neath the VFO. The wire from the OA2 and the terminal strip fit nicely through the grommet right there inside the vfo. I did not want to have to work inside that VFO cabinet either.

Visually inspect the resistor and measure that 18K value.

Oh yes, my 6AU6 checked out good on my borrowed tube tester but it was bad anyway. Replaced it and that was the end of it.

73,

Scott WA9WFA Saint Paul Minn

> -----Original Message-----
> From: w5hvv@aeneas.net [SMTP:w5hvv@aeneas.net]
> Sent: Wednesday, February 04, 1998 8:20 PM
> To: glowbugs@www.atl.org; BOATANCHORS@LISTSERV.TEMPE.GOV
> Subject: Chirpy Viking Ranger
>
> I am in the process of attempting to repair a Viking Ranger for a
> friend of mine that has entrusted it to me for that purpose (talk
> about mis-guided trust!). I have used kerosene to clean up the

> chassis and so forth and it looks like a million dollars now.....
> but the purpose he gave it to me was to get it to quite chirping and
> migrating up the frequency while transmitting. I have removed the
> side panel from the VFO unit and the OA2 is glowing all the time;
> just a tad less when the key is down, so I discount it as a problem.
> I don't have (at the moment) a spare 6AU6 to try but can get one from
> my supply tomorrow or the next day.
>
> My question is: is there anyone out there that has encountered a
> similar problem and is there something easy to do that will correct
> it? I have an absolute horror of trying to remove the entire VFO so
> that I may get to any temperature sensitive capacitors or the tuning
> capacitor. It appears that I would have to take off the front panel.
> I am not into that much pain. Is there anything else that is a
> viable alternative? Anyone had to fix a similar problem on their
> Viking Ranger and can tell me where to go to look for the problem?
>
> Thanks,
>
> Rod, N5HV
> w5hvv@aeneas.net
>

Date: Thu, 5 Feb 1998 11:12:09 -0500 (EST)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: How to make a dial?

For simple dials, I usually opt for a plastic pointer mounted on a
normal big knob (they usually have three mounting holes on the back
of the knob for such things). Print out a dial on cardstock and away
you go.

If you need vernier mechanisms, then that requires a subpanel to mount
a vernier on, and some sort of dial knob thingie or plate with setscrew
to mount the pointer on. I do a lot of scrounging for 1/4 inch setscrew
gears and round thingies that I can use for such projects.

Cutting a good round dial plate from plastic or aluminum is not easy.
But, with a large circle cutter and a lot of care, you can do a pretty
good job. Go very slowly in the cutting and take lots of time to make
sure the cut is smooth.

If you want a dial with a string drive, then cut three thin dial
wheels, two of the same size and one slightly smaller, and mount
a large O-ring, or rubber band or string or whatever in the groove
between wheels (large smaller large wheels assembled or glued together).

For rim drive, use a variable resistor shaft and thimble and attach
a drive wheel of some kind to it (a grommet should work). That would
be a little like the GenRad or Hammarlund rim drive dials.

For a slide-rule dial, you need running wheels and a pointer of some
kind. Running wheels can be gotten from curtain fixtures at the
hardware store. Mounting them and putting on a good drive string
is tricky. 5 wheels, a spring and the grommet drive thingie from above
will work pretty well. Then you have to mount up the wheels on bushings
of some sort, and mount a glass or plastic viewing window. Then string
in the wheels as a normal sliderule dial and use the spring to keep
tension on the whole. A small 2 or 3 inch spring about 1/8 to 1/4
inch coil diameter works well, and can be found at hardware stores.

I have heard the CD dial thing, but never tried one.   It would be
colorful.....(:+}}.... Maybe a laser videodisk for a big dial......

I have some dials for laserjet or postscript output somewhere on
the glowbugs archive site They are mostly for antique things though,
but they might be of use. Print on a 1 per page label and cut to suit.

Good Luck

Bob/NA4G

End of glowbugs V1 #238
****